DATA ACQUISITION SYSTEM FOR NONDESTRUCTIVE EVALUATION OF SPENT NUCLEAR FUEL

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INEEL

Introduction

- Need to inspect Spent Nuclear Fuel canisters
- Spent Fuel must be removed from wet storage by 2003
- Inspection system assists in this move

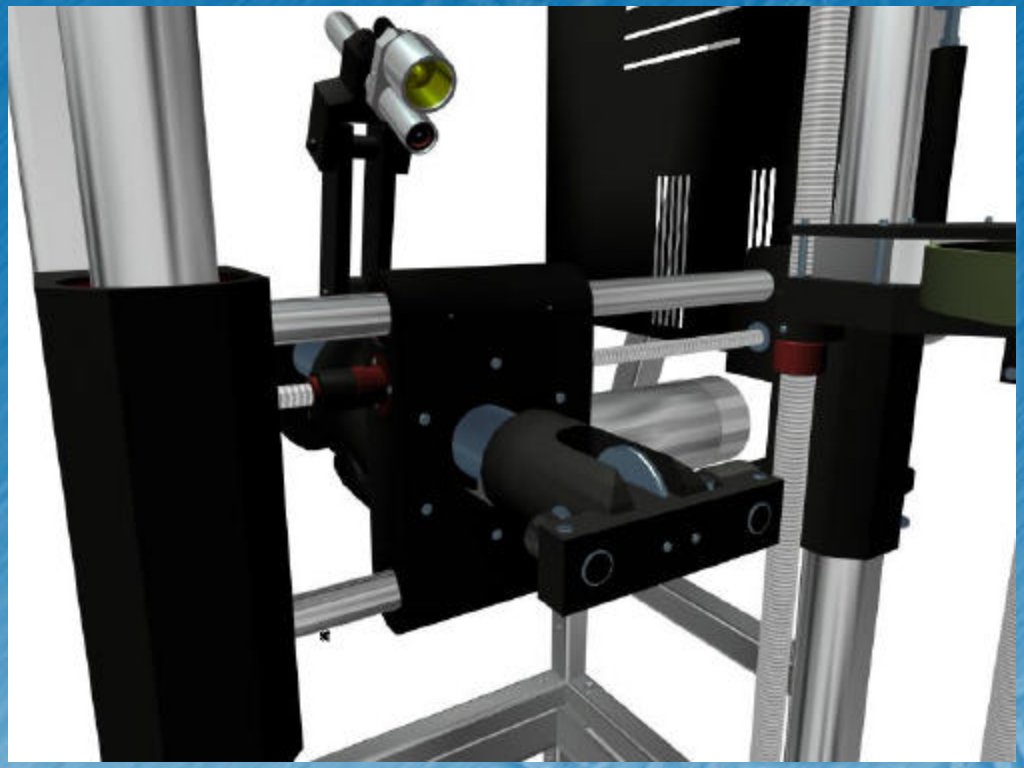
Multi-Axis Inspection System

- 10 axes of motion
  (x,y,z,swivel, gimbal)*2
- Ultrasonic tests
- Video navigation
- Remotely operated
- Scanner is submerged

Two Major Components

- Control console
- Remote scanner

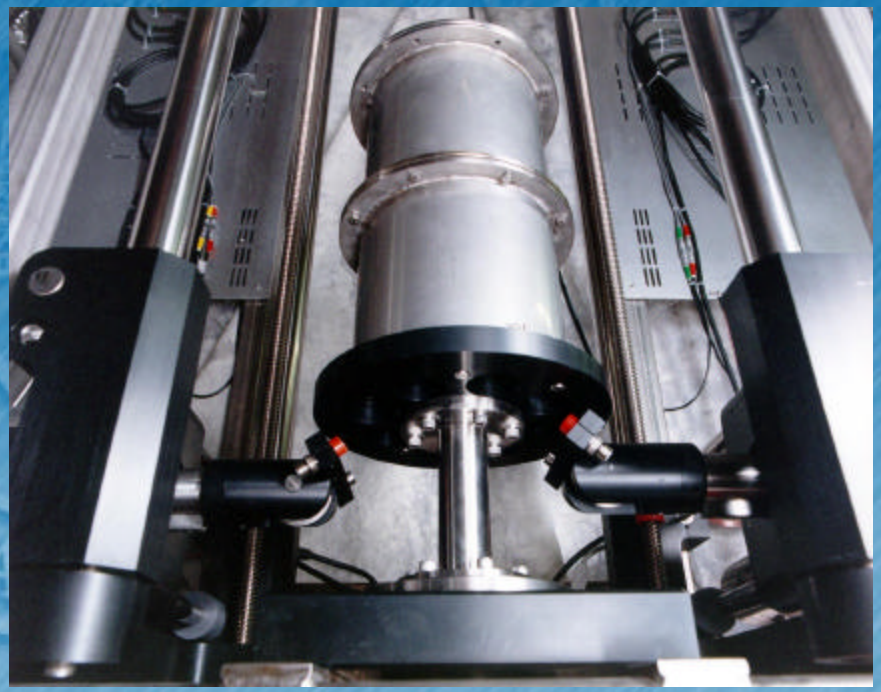
Sensors



- Four ultrasonic transducers
- Three video cameras

Options

- ‘V-clamp’
- Turntable



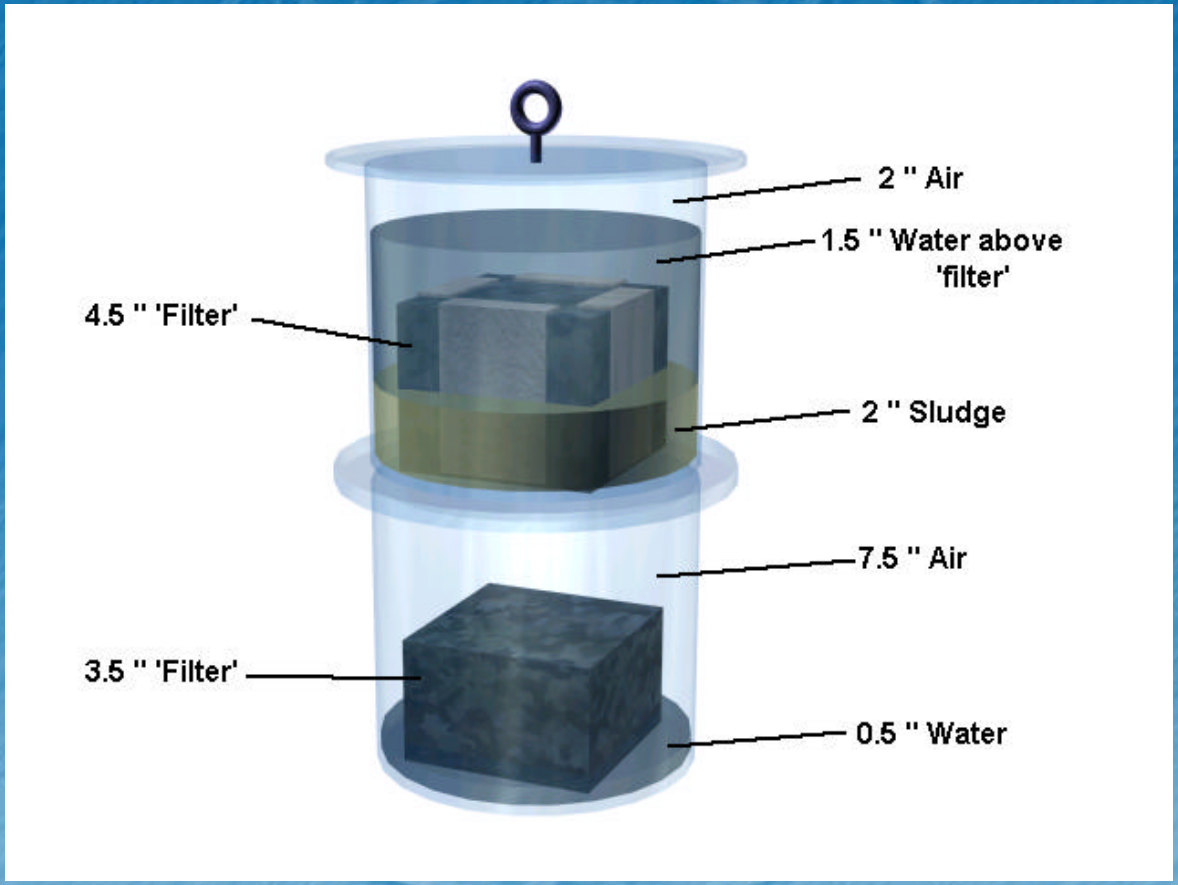
System Capabilities

- Detect water intrusion
- Detect and quantify corrosion in canister walls
- Image canister contents
- Determine or verify canister dimensions

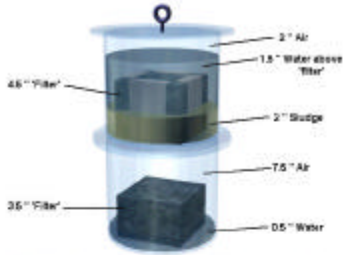
Mechanical Performance

• X (front-to-back)		9.2”	+/- 0.005”
• Y (in-out)		9.0”	+/- 0.005”
• Z (vertical)		61.3”	+/- 0.005”
• Gimbal	(xducer angle)	150º	1º
• Swivel	(xducer rotation)	349º	1º

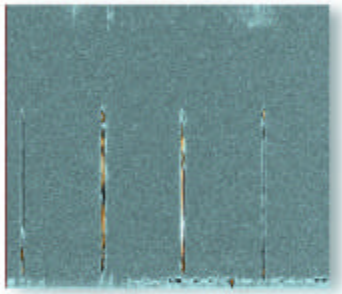
Reference Standards



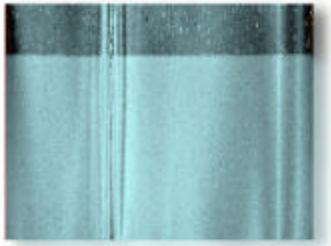
Sample Data



Reference Standard

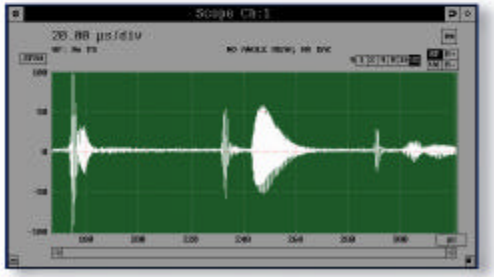


Internal Reflectors



Ring-Down

Thru-Transmission



Up-Looking (A-scan)

Ring-Down w/ Sludge

Future - Tomographic Imaging